

What is claimed is:

1 1. An electronic package having one or more components
2 comprising:
3 a substrate having a first coefficient of thermal
4 expansion;
5 a lid attached to said substrate, said lid including a
6 vapor chamber, the lid having a second coefficient of
7 thermal expansion, said first coefficient of thermal
8 expansion matched to said second coefficient of expansion;
9 a thermal transfer medium in contact with a back
10 surface of each component and an outer surface of a lower
11 wall of said lid; and
12 each component electrically connected to a top surface
13 of said substrate.

1 2. The electronic package of claim 1, wherein said lower
2 wall of said lid has a third coefficient of thermal
3 expansion and said components have a fourth coefficient of
4 expansion, said third coefficient of expansion matched to
5 said fourth coefficient of expansion.

1 3. The electronic package of claim 1, further including a
2 heat sink having a fifth coefficient of thermal expansion
3 mounted to an outer surface of a top wall of said lid, said
4 fifth coefficient of expansion matched to said second
5 coefficient of expansion.

1 4. The electronic package of claim 1, wherein said lower
2 wall of said lid has protruding regions for maintaining
3 equivalent contact with said thermal transfer medium on thin
4 components of said components as is maintained by thin
5 regions on thick components of said components.

1 5. The electronic package of claim 1, further including
2 supports within said vapor chamber between an upper wall of
3 said vapor chamber and said lower wall, some or all of said
4 supports aligned over some or all of said components.

1 6. The electronic package of claim 5, wherein said supports
2 are integrally formed with said lid.

1 7. The electronic package of claim 1, wherein said package
2 is selected from the group consisting of ball grid array

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3 modules, pin grid array modules, land grid array modules and
4 HyperBGA™ modules.

1 8. The electronic package of claim 1, wherein said lid is
2 formed from material selected from the group consisting of
3 aluminum, copper, Invar, gold, silver, nickel, aluminum-
4 silicon carbide, plastics, ceramics and composites.

1 9. The electronic package of claim 1, wherein said substrate
2 includes material selected from the group consisting of
3 ceramics, fiberglass, polytetraflouoroethylene, and polymers.

1 10. A method for dissipating heat from an electronic package
2 having one or more components comprising:
3 providing a substrate having a first coefficient of
4 thermal expansion;
5 attaching a lid to said substrate, said lid including a
6 vapor chamber, the lid having a second coefficient of
7 thermal expansion;
8 matching said first coefficient of thermal expansion
9 matched to said second coefficient of expansion;
10 providing a thermal transfer medium in contact with a
11 back surface of each component and an outer surface of a
12 lower wall of said lid; and
13 electrically connecting each component to a top surface
14 of said substrate.

1 11. The method of claim 10, wherein said lower wall of said
2 lid has a third coefficient of thermal expansion and said
3 components have a fourth coefficient of expansion and
4 further including matching said third coefficient of
5 expansion to said fourth coefficient of expansion.

1 12. The method of claim 10, further including:

2 mounting a heat sink having a fifth coefficient of
3 thermal expansion to an outer surface of a top wall of said
4 lid, and
5 matching said fifth coefficient of expansion to said
6 second coefficient of expansion.

1 13. The method of claim 10, wherein said lower wall of said
2 lid has protruding regions for maintaining equivalent
3 contact with said thermal transfer medium on thin components
4 of said components as is maintained by thin regions on thick
5 components of said components.

1 14. The method of claim 10, further including providing
2 supports within said vapor chamber between an upper wall of
3 said vapor chamber and said lower wall, some or all of said
4 supports aligned over some or all of said components.

1 15. The method of claim 10, wherein said package is selected
2 from the group consisting of ball grid array modules, pin
3 grid array modules, land grid array modules and HyperBGA™
4 modules.

1 16. The method of claim 1, wherein said lid is formed from
2 material selected from the group consisting of aluminum,
3 copper, Invar, gold, silver, nickel, aluminum-silicon
4 carbide, plastics, ceramics and composites.

1 17. The method of claim 10, wherein said substrate includes
2 material selected from the group consisting of ceramics,
3 fiberglass, polytetraflouoroethylene, and polymers.

1 18. An electronic package having one or more components
2 comprising:
3 a substrate having a first coefficient of thermal
4 expansion;
5 a lid attached to said substrate, said lid including a
6 vapor chamber, the lid having a second coefficient of
7 thermal expansion, said first coefficient of thermal
8 expansion between about 25% to about 700% of said second
9 coefficient of expansion;
10 a thermal transfer medium in contact with a back
11 surface of each component and an outer surface of a lower
12 wall of said lid; and
13 each component electrically connected to a top surface
14 of said substrate.

1 19. The electronic package of claim 18, wherein said lower
2 wall of said lid has a third coefficient of thermal
3 expansion and said components have a fourth coefficient of
4 expansion, said third coefficient of thermal expansion
5 between about 50% to about 700% of said fourth coefficient
6 of expansion.

1 20. The electronic package of claim 18, further including a
2 heat sink having a fifth coefficient of thermal expansion
3 mounted to an outer surface of a top wall of said lid, said
4 fifth coefficient of expansion between about 25% to about
5 700% of said first coefficient of expansion.